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LA CONSTRUCCIÓN CIENTÍFICA DEL SEXO

THE SCIENTIFIC CONSTRUCTION OF SEX

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Resumen

Este texto presenta un análisis sobre la emergencia y la construcción científica del sexo a partir de un análisis historiográfico que comprende el periodo de finales del siglo XVIII al siglo XX. En el análisis se muestra que el desarrollo de este saber científico ha operado a partir de una triple coproducción de (i) taxonomías y nomenclaturas, (ii) etiologías y (iii) regímenes de subjetividad. De igual forma se propone que en esta historia de la ciencia surgió en pleno siglo XX un tercer modelo sobre el sexo, siguiendo la historización propuesta por Thomas Laqueur, que resultó fundamental no solamente para posibilitar la existencia material de nuevas identidades sexuales sino también para entender el contexto social y político de la época en el escenario occidental. El presente texto contribuye a complejizar y entender de mejor forma la relación entre ciencia, sexo-género y subjetividad de tal manera que la historia de la ciencia permita abrir un diálogo con las problemáticas de nuestros días.

Palabras Clave: sexo, ciencia y género, historia de la ciencia, historia de la subjetividad, sexualidades

Abstract

This paper presents an analysis of the emergence of sex as an object of study and its scientific construction, based on a historiographic analysis which covers the period from the end of the 18th century to the 20th century. The study shows that the scientific development of this knowledge has operated through a threefold production of (i) taxonomies and nomenclatures, (ii) etiologies and (iii) regimes of subjectivity. I propose further that in the history of this area of science, a third model of sex emerged in the twentieth century to add to the previous two, following the historicizing promoted by Thomas Laqueur, which was fundamental not only for making the material existence of new sexual identities a possibility, but also for understanding the social and political context of the time, in the western world. The present article helps to explain the complexities of the relation of science to sex/gender and subjectivity, so it can be understood better, and shows how a historical account of the science on this topic can to contribute to starting a dialogue on problems of the present.

Keywords: sex, science and gender, history of science, history of subjectivity, sexualities

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The main objective of this article is to produce a historiography of the emergence and construction of sex as an object of scientific study. The aim is to show how scientific knowledge of an aspect of sexuality has developed through the threefold production of (i) taxonomies and nomenclatures, and (ii) etiologies, which in turn contribute to the constitution of (iii) a regime of subjectivities concerned with scientific knowledge of sexuality.

Taxonomies and nomenclatures are understood in this article as the classifications, and the terms, used by scientists to explain sexual and gender diversity by considering it in terms of groups or classes of individuals thought to have certain characteristics in common. By etiologies is meant the causal explanations given by scientists for a phenomenon, in this case that of sexual and gender diversity. And the term *regime of subjectivity,* inspired by the work of Michel Foucault in *La Historia de la Sexualidad Vol. I* (2011) and in *La Hermenéutica del Sujeto* (2002), refers to a model where the subject is judged and ruled, or judges and rules himself, by his or her belonging to a class.

The notion of a threefold coproduction, also inspired by Foucault, aims to capture the process whereby science, as it explains the various sexual behaviors that exist, creates sexual classifications that are, in their turn, explained by the postulation of etiologies, or causal mechanisms, which then create classes of subjects. At the same time, these classifications and etiologies create regimes of subjectivity, in so far as they serve as a hermeneutics for the subject, that is, as a form through which the subject can be explained but can also comprehend himself.

Here it is important to note that the way in which the notion of a regime of subjectivity is used does not only refer to the forms that explain subjects but also to the therapeutics and material interventions applied by science and medicine, which many subjects decide to apply to themselves, as members of a particular classification or class of subject.

In other words, the idea of a threefold coproduction can show that at least in this case of sexuality, as it explains sexual behaviors, science creates forms of subjectivity or classes of subject. But the threefold coproduction also explains how science incorporates into its taxonomies and etiologies, other taxonomies, regimes of subjectivity and narratives that had been produced by examples of sexual diversity in contexts that were not scientific or medical,

which leaves the explanation of subjects open, and not historically determined by scientific authority, but free to respond to the historical development of science itself and of the sexual collectivities involved.

The importance of thinking about the scientific construction of sex using the methodology of a threefold coproduction lies in the fact that this provides us with a complex image of the dynamics of science in the construction of sex as an object of scientific study. The complexity of the image is due to the recognition that scientific explanations produce subjectivities, and that subjectivities in turn are liable to affect the explanations given by science.

The second objective of the article is to show how, in the course of this history, another model of sex emerged after the historicizing of sex developed by Laqueur (1994), which would become essential for explaining the political and social changes of the twentieth century, when sexual diversities and women acquired greater social visibility on the political scene in the Western context.

This work has both academic and political motivations. The former is the wish to develop a historiographic and philosophical study of sex in the framework of the larger theoretical task of showing how a field of studies of sexuality, rooted in a scientific approach, arose, and trying to explain how objects of scientific study are created.

A historiographic analysis of this kind, shows how the scientific construction of sex took place, and how, in the course of this construction, a series of reductionist, biologic and essentialist explanations were adopted that created a "truth about sex", which produced both new sexual identities and new ways of expressing one's sexuality; a necessary step in the development of a critique of the contemporary biologic conceptions still being produced by science today.

But our historiography of the scientific construction of sex is also an attempt to show the complexities of the relations between science, sex/gender, and subjectivity, as we hope to show that in science, the notion of sex has never been self-evident, rather that its construction has been the result of controversies between different scientific disciplines, influenced by social contexts.

From this comes the political motivation of the study, as today in different parts of the world we are passing through a political context in which there are anti-rights groups who believe that appealing to a constructivist notion of sex is to be ideological, hence to have a "gender ideology" opposed to what science has to say, while at the same time they ignore the complicated history of sex and what the history of science can teach us on the subject.

Thus the text is divided into four sections. The first presents the account given by Thomas Laqueur and shows how his work explains the first two main models of sex, and the historical reasons for the replacement of one by the other. In this section we shall also show how the three parts of the coproduction of each of the two models are thought to be linked.

The second and third sections will contain the proposal of a third model for sex, and both the scientific and the political reasons for its emergence will be explored. Every paragraph will show how the three elements of the coproduction of each of these models of sex are linked. The final part will present the Conclusions.

The historicizing of sex

One of the principal contributions of Thomas Laqueur (1994) in his classic work *The Construction of Sex,* is to have shown the historical character of concepts of sex. He proposes that there are two models of sex which have been used to explain sexual differences, and gives historical reasons for why one model replaced the other.

The first model is the one-sex model. This had its origin in the writings of the Greek physician Galen of Pergamon, and up until the eighteenth and nineteenth centuries it had been the predominant model for explaining differences between the sexes. According to this idea, men and women had the same sexual organs but in one case they were inside the body and in the other they were outside, making the differences between men and women differences of degree and not of type. These differences showed women to be imperfect or defective versions of men, which makes the model hierarchical. The physiology of the model accepted the theory of universal fluids or humors that the heat of the body would give a particular form to, and this explained the differences between men and women (Laqueur, 1994).

In this model, as explained by Vázquez-García (2018, p. 19), the nature of the body was fluid and open-ended and might be influenced by activities and occupations, which is explained by the fact that in this model the relation of the body to the environment was more permeable than today. In short, sex here was a "rank" that was expressed both in a person's physical condition and in his social attributes, both in his dress, and his genitalia.

At the end of the Enlightenment, after the eighteenth century, as Laqueur (1994) tells us, this model was replaced by that of two sexes. The new model continued to be hierarchical in the sense that a natural or biological inferiority was attributed to the woman, but now the difference between the sexes was one of type and no longer one of degree as it had been in the first model. In effect, there was thought to be a radical difference between men and women that created two opposite and completely different sexes, which were complementary and incommensurable in all aspects both of the body and of the personality. This model was functional, as the differences between the sexes were to be found in their functions, especially those of sex and reproduction, which were termed "generative functions".

According to Laqueur (1994), this change of conceptions about the sexes was due to political factors, as the two-sex model sought to maintain and naturalize the social hierarchy of men and women, inherited from the old stratified order, and so put an end to the liberal revolutions fomented by Enlightenment ideas that presented both men and women as equal citizens. Thus the two-sex model came to legitimize the dominant ideas of the time such as the roles given to women, focused on reproduction and the "private sphere".

Sociologist Myra Hird (2004, p. 22) also maintains that this transition from one model to another was not the result of any discovery made by medicine, but of political changes. But in addition to political factors she notes changes in epistemology that gave the same body, new meanings. On the basis of scientific knowledge, the Enlightenment brought in a way of approaching the body that meant breaking it up into its parts in order for it to reveal its truth. So what sex, and sexual difference, was essentially, was determined by visible objects.

It was in this context that the two-sex model was constructed by invoking biological differences, but for this to occur biology had to be established as a science and, as explained by Vázquez-García (2018, p. 20), life now had to be regarded as a desacralized space, a process left to itself and ruled by its own rules and regulations. From this moment on we can say correctly that biologic projects on sex started, looking at bones, gonads, hormones, chromosomes and genes to find the essence of what might be the natural cause regulating the differences between the sexes.

So far, we can see that in each of the two models, the relation between taxonomy and etiology, and the subjectivity regime, is judged differently. In the first model there is a taxonomy that has, as well as men and women, intermediate conditions such as "various

types of hermaphrodite, men who produce milk or menstruate, women with a prominent clitoris or viragos, tongue-and-groove men, etc." (Vázquez-García, 2018, p. 16).

Here the etiology of each sex is given by a physiology of humors where the body is open to the environment. Those in the intermediate categories could show improvements to their sex as a function of changes in the balance of the humors, and women who adopted male customs and clothes could present physical changes that turned them into men (Vázquez-García, 2018, p. 16-17).

It is important to note that as there were no dichotomies before the nineteenth century of nature vs. society, or biology vs. culture, the sexes were explained by appealing to Nature, not in the biological sense it has now, but understanding it as a moral order that expressed the will of God. This vision of the world was backed by Galenic medicine. This needs to be said because in this etiology the existence of "hermaphrodites" was considered a natural possibility, something rare but not monstrous (Vázquez-García, 2018, p.16).

With regard to the regimes of subjectivity in this single-sex model, sex was conceived of as a degree or rank, which justified the division of the sexes that was actually maintained by the Church and civil authorities. In the two-sex model, now rooted in the nineteenth century idea of biology, the only taxonomy allowed was one in which men and women existed under the premise of radical difference. The possibility of intermediate states was denied and everything that did not fit into the binary man-woman construct could only be found in the taxonomies of late nineteenth century sexologists.

One example is given by the German psychiatrist Richard von Krafft-Ebing, who placed into the field of the scornfully labeled "sexual inverts", a great variety of practices and sexual behaviors that were mainly associated with homosexuality, but also included subjects who identified with the opposite sex (Meyerowitz, 2004).

The etiology at play in this model was no longer that of a body open to the environment, as in the single-sex model, but a closed-off body where causality was to be found in the gonads and their secretions. The era of the gonads had come to mean that the essence of sex, gender and sexuality was to be found in these (Meyerowitz, 2004, p. 27). That is why, in the case of "hermaphrodites", the truth of sex was sought mainly by appealing to the gonads. In the case of "sexual inverts", an etiology of pathology was applied in which doctors and psychiatrists considered their condition as an illness or a perversion and its cause was supposed to lie in the gonads.

In respect of the regimes of subjectivity, these etiologies made subjects to be seen, and to see themselves, as ill. In the case of homosexuality, practices were followed in which the gonads of heterosexual men were transplanted to homosexual men as part of a therapy seeking to restore heterosexuality (Meyerowitz, 2004, p. 17). With regard to "hermaphrodites", these became doubtful cases that had to be put under the magnifying glass of specialists and forensic doctors so they could "diagnose" the real sex, and if they found a contradiction between the "real sex" and the subject's identity, then the identity had to be corrected under the mandate of biology.

The third model of sex

So far we have presented the two models of sex that came out of the work of Thomas Laqueur, and have shown how in these two models, the taxonomies, etiologies and regimes of subjectivity involved in a threefold production of the model, were all linked. These models are the ones most used in studies of science and studies of the body as they allow the historicity of narratives of the body and the ontology of sex to be taken into account. In this

section our aim is to show how a third model of sex emerged in the first half of the twentieth century, in the wake of the difficulties that the second model came up against.

This third model was one of two sexes, hierarchical, not functionalist and not radically exclusive; and now bodies are thought of as being on a gradient. The differences between the sexes are noted, but so are the similarities between them, so this model is not committed to a metaphysics in which anatomy and physiology are incommensurable. It is on the basis of this model, that sex comes to be thought of as something that can be modified and altered by medicine.

The new model of sex arose as a result of the crisis that the second model faced both for political reasons and for the reasons given by scientific practice at the start of the twentieth century. The former derived from the fact that as women had begun to occupy posts of paid employment and started to obtain higher education, and a women's movement was formed to demand equal rights with men, it became clear that men and women did not naturally belong to "different spheres" as the model of radical exclusion between the sexes held (Preciado, 2010). Also, the prominence acquired by male and female homosexual collectives made it plain that there was not a radical dividing line between the sexes in the world of sexual desire, but, on the contrary, desire for men and desire for women, as for masculinity and femininity, existed in both groups (Meyerowitz, 2004, p. 22).

This was not only a political but also a scientific fact, as researchers had found that with respect to evidence, the idea of the sexes as incommensurable was unsustainable. For scientific reasons, it was necessary to have a new conception of sex, and evidence that came principally from the recently created study of endocrinology allowed the third model of sex to take shape.

This new conception of sex was based on, and developed from, the theory of bisexuality, as it was called. The theory of bisexuality, developed from the early years of the twentieth century onwards, held that the sexes were biologically, that is, organically, bisexual, as they both had some aspects in common, not just in terms of masculinity and femininity but also in terms of biological sex.

Meyerowitz (2004, p. 23) reports that the theory of bisexuality began to receive the backing of studies in embryology, that showed there was a sexual differentiation common to the two sexes in the process of development, and that of statistical studies on psychic and corporeal differences, which showed that the sexes were not two clearly distinct groups but that there was an overlap between them.

Thus the theory of bisexuality sustained a conception of sex as an abstract continuum, and the sex of every individual was really a matter of degree, where the male and female sexes are substances with different proportions. Both Hirschfeld and Havelock Ellis stuck to this idea and became disseminators of the bisexuality theory (Meyerowitz, 2004, p. 26).

Discoveries in endocrinology in the 1930s were fundamental to the formation of what is called the third model, as the discovery that there were male and female hormones in both sexes gave empirical support to the idea that there were male and female elements in both sexes, only in different proportions. In this way the conception of sex as an individual variation at a point on a spectrum came to replace the second model, of mutual exclusion.

This new third model of sex would reorganize the threefold relation between the taxonomies, etiologies and regimes of subjectivity involved, in a different way. With regard to taxonomies, we find that Magnus Hirschfeld, one of the principal defenders of this conception of sex, was interested in depathologizing the subject, by recognizing the existence

of “sexual intermediaries” (“hermaphrodites”, androgynes, homosexuals and transvestites), as part of human variety (Meyerowitz, 2004).

There is a fundamental difference here with the taxonomies related to the second model of sex, as all of these placed on the side of perversion and pathology all sexual subjects that the model could not explain as part of a notion of radical mutual exclusion by the two sexes. In fact, Meyerowitz (2004, p. 98) reports that in the United States, this confrontation between conceptions of sex as being either on a continuum or mutually exclusive, was expressed in the theories of a group of doctors who adhered to the first position, and the group of psychoanalysts, psychologists and psychiatrists who held to the second idea.

In spite of which, it does not follow that the third model was free of pathologizing connotations, as, although Hirschfeld was thinking from the point of view of human variation, there were other doctors who had an interest in remedying what was considered to be a “biological defect”. This connects directly with etiologies, because in this third model there were etiologies of human variation at play, based on individual variations of sex understood as a continuum, just as much as etiologies of biological failures. Whether these etiologies were of variation or of biological failure they had within them a clearly biologic element that anchored the essence of sex, of masculinity and femininity, no longer in the gonads but in hormones.

The regimes of subjectivity that stemmed from this were of two types. Firstly those committed to depathologizing the topic did not seek to remedy something that was considered to be a biological failing, and was the line taken by Hirschfeld and by the Austrian philosopher Otto Weininger in the first decades of the twentieth century. In fact, Hirschfeld was committed to promoting what he considered sexual freedom and in the Institute for the

Science of Sex he sought to help “transvestites” who wanted a change of sex (Meyerowitz, 2004, p. 30).

Secondly, commitments to depathologizing the topic were not shared by all the doctors as there were still some who claimed that once the causes of non-hegemonic sexual behaviors, understood as biological failures, were known, it was possible to restore these subjects to cisheterosexuality[2].

Also, although it conceived of sex as being on a continuum, this model still legitimized an unequal society, as it stemmed from a hierarchical view of the sexes in which the female was associated with inferior characteristics and the male with superior characteristics. The notion of the body as being on a gradient explained, for example, the social success of some women in terms of their having a higher degree of masculinity (Meyerowitz, 2004, p. 25).

In therapeutic terms, this third model of sex re-launched the possibility of changing one’s sex with greater force, as the notion of the body on a gradient and the identification of sexual hormones as sexual markers made it possible to explain that changing sex was a natural possibility, allowed by the very biology of the body, as seen in the proportions of hormones.

We can therefore say that this third model of sex is reconceptualized and ceases to be immutable, as distinct from the second model. The new model resulted in a historical break-up of the conceptual and material understanding of sex, as it was on the basis of this model that for the first time in human history, sex, primarily governed by proportions of hormones, would be thought of as something that could be intervened in and directed. As a result, throughout the twentieth century, a whole series of medical technologies using hormones arose, and these would make it possible not only for transsexual subjects to appear, but for

there to be more control and regulation of sex, as in the case of contraceptive pills that alter the cycles of hormones, hormones used by sportspeople to promote the growth of muscular mass, and hormone supplements for women past menopause.

It is important to note on this last point that this model, that allowed intervention in sex and its direction, opened up a market for the pharmaceutical industry. Oudshoorn (2000) mentions that the emergence of an endocrinology of sex, as well as keeping doctors and scientists at work, was an attraction for pharmaceutical companies.

In his work *The Birth of Sex Hormones*, Oudshoorn (2000) also points out that in the twentieth century there arose another model of sex, motivated mainly by endocrinology, which had discovered that the sexual hormones originated and functioned in both sexes, and this had the effect of displacing the essence of masculinity and femininity from specific organs, where the anatomists had placed it, to quantities of hormones.

According to Oudshoorn, this model had the effect of reformulating sex in terms of chemical substances as well as bodily structures. Introducing the concept of sexual hormones, understood as chemical messengers that controlled masculinity and femininity, meant a break from the conceptualization of sex as it had been in the past, as it went from being an anatomical entity to being a chemical agency (Oudshoorn, 2000, p. 110). Endocrinology would also mean a change in the study of sex, now looking for its causes instead of trying to identify it, as well as the introduction of a quantitative theory of sex and the body. Sex was no longer an absolute, but became a relative specificity, and the difference between the sexes was no longer one of type but of degree. Oudshoorn (2000) also notes the capacity that this model has for accounting for the sexual diversity of individuals, both in terms of physical characteristics and of personality, by proposing a biological basis for sex.

Both the model reported on by Oudshoorn and the model proposed in this article agree that the sexes are now conceived of as being different in terms of degree and not of type, so we are no longer dealing with a model of radical exclusion of one sex by the other. Another point of agreement is our recognition that a quantitative theory of the body and sex, is derived from this new model, where differences are thought of in terms of quotients of hormones. Finally, we agree that the new model has the capacity to provide a biological explanation that integrates the various sexual subjectivities.

The differences between the two new models are, that the model proposed here takes note of the fact that the relation between the sexes was still being regarded hierarchically, with the female sex considered inferior, but we have now come to a non-functionalist notion of sex, which means that sex is no longer centered on definitions based on the reproductive function of evolutionary biologists, for whom to be male is to have the function of producing spermatozoa and to be female is to have the function of producing ovaries (Guerrero-McManus, 2013). Instead, we have advanced to a notion of sex understood as a sexed body. Another difference is that the model proposed here recovers the mutable and interventionist character that sex and the body acquired in the first decades of the twentieth century, and this allows access to a conceptual apparatus for taking into account how sex is socially altered by the technological and conceptual products of science.

Finally Oudshoorn explains that the reasons for passing from the second to the third model were to be found principally in the discoveries of endocrinology, while the model I propose here not only takes up the discoveries of endocrinology but also the role played by the social and political context in which women's, homosexual, and lesbian movements brought scientists to recognize that their conception of sex did not coincide with the reality it claimed to describe.

In the next section we shall see how this third model was modified in the middle of the twentieth century when the category of *gender* came in, a modification that Oudshoorn did not consider in her model.

The third model of sex with the arrival of gender

In this final section it is proposed that half way through the twentieth century the third model of sex underwent modifications as a result of interdisciplinary conflicts in the United States, debating the causes of gender identity among intersexual and transsexual persons.

What the third model that came out of these discussions retained of the original third model is that it was still one of two sexes, non-functionalist, and not of radical exclusion. The differences between the earlier and the later versions of the third model are that sex was now no longer considered as an absolute ontology for organizing the bodily, psychological and social field, but as an ontology of biological causes that gives an account of how a body develops as soma. Also, in this model of a sexed body, as well as thinking of it as being on a gradient, it started to be thought of as a stratified sexed body, that is to say, an ontogenetic comprehension of the sexed body began to consolidate in which, with the sexual development of the body, examples of sex were to be found at every one of the levels of organization or bodily strata (chromosomes, tissues, organs, hormone levels, etc.)[3].

The historical reasons for the emergence of this new model are found, first, in the appearance in the works of John Money, of the category of gender, and secondly, in the controversy between doctors, psychoanalysts, and psychologists over the etiology and the therapeutics of gender identity among intersexual and transsexual persons.

The research of John Money and the Hampson brothers established in the mid nineteen fifties, through studies of the morphology, physiology and psychosexual

development of intersexual children, that masculinity and femininity did not have their causes in biology (Fausto-Sterling, 2006, p. 66). As a result of this, Money defined the category of gender as a behavior and an attitude that had its cause in environmental factors understood principally as nurture (Fausto-Sterling, 2006, p. 66).

With the invention of the category *gender*, a division was forged in the order of things that signaled a biological origin on the one hand, and on the other, social conditioning appropriate for the sexual behaviors of men and women, that is, it grouped as *sex* a set of biological characteristics that differed for each group and would result in a sexual dimorphism, and as *gender*, the different sexual behaviors, male and female, of men and women, which would have a social origin.

This is how the conception of sex that came with the previous third model was restricted to being only a set of biological characteristics without reaching as far as the behaviors of subjects. The works published by Money, in turn, were a confirmation from another field of science, in anthropological studies produced since the 1920s, that there were variations in "gender roles" across cultures, whose cause was to be found in social learning.

This model, called "environmentalist" was the approach defended by Money in the controversy over the causes of gender identity, in which doctors defended a biologic focus while psychoanalysts held to an approach based on the psychodynamics of infancy. It was due to this controversy about the etiology of gender identity that doctors no less than psychologists and psychiatrists found it necessary to define what sex was, in order to be able to be able to describe the kind of relation that sex had with gender identity, and then if some component of sex was the most essential and determining, reveal the truth about sex and the subject.

Money proposed a model for sex, stratified in six levels, which was made up of: chromosome sex, foetal gonad sex, foetal hormone sex, internal reproductive sex, cerebral sex and genital sex (Fausto-Sterling, 2012, p. 10). For Harry Benjamin, sex had six components, which were: chromosome sex, genetic sex, gonad sex, germinal sex, hormone, anatomical, psychological, legal and social sex. From the work he had done with transsexual subjects he deduced that on some levels sex could be modified either by hormonal or surgical technologies (Meyerowitz, 2004, p. 118).

According to Meyerowitz (2004), Stoller adopted a similar approach, because sex for him was not only a question of chromosomes but consisted of various levels: chromosomes, interior genitals, gonads, external genitals, hormonal states and secondary sexual characteristics.

What we can see from this is that once sex was defined as a set of characteristics made up of different levels, the body ceased to be thought of principally as a gradient because it was no longer centered on hormonal determinism. So the body came to be thought of as a composition of strata whose interactions gave a structure to the sex of the individual. This idea was not against thinking of sex as a continuum, as the new model did not reject the idea that sex had different ways of assuming form that could not be limited to two mutually exclusive connections.

The taxonomies arising from this model would include and give possibilities to transsexual, cissexual, transgender and cisgender persons, transvestites, intersexuals, endosexuals and the whole diversity of behaviors that get their meaning from the dichotomy of sex and gender. The etiologies linked to this are many and varied, with on one side those who adopt a biologic perspective on this model and appeal to diversity or “biological failure”

to explain gender as a causal extension of sex, with the majority of approaches in biology and biomedicine being of this type (Saraswast, Weinand and Safer, 2015).

A second type of etiology arising from this model comes from the "environmentalist" or social approaches that seek to explain the body as a biological cause, on the one hand, and as a social cause, on the other. In this type of etiology are to be found the approaches of psychology, sociology and feminist studies. In fact it is important to point out that elaborations made in the tradition of feminist studies have openly defended this model, or have assumed it, at least in its most traditional version, where sex is soma and gender is culture.

With regard to the regimes of subjectivity, this model would accept both the approach of human variation and that of biological failure, but having admitted the distinction between sex and gender this model is also open to, and has opened up, subjective paths to formulating a social critique in relation to sexuality and gender. One example of which is that of the women's political movements, motivated by feminist theorizing on the existence of a sex-gender system (Rubin, 1986) that imposes gender and sexuality, which ran through the second half of the twentieth century in opposition to the patriarchy. The trans, gay and lesbian movements of the second half of the twentieth century and the start of the twenty-first were also influenced by this model of sex.

In respect of the emergence of identities, the transgender identity, as an identity critical of the insistence made by medicine that surgery was required to reassign sex if transsexual subjects were to be validated, arose in the nineteen eighties (Pons and Garosi, 2016), and differed from the transsexual identity on the basis of our model in that the distinction between sex and gender made it possible to recognize that gender could be changed without the need to alter sex technologically.

Another of the subjectivizing effects that this model of sex has had may be seen in the reach and the impact of the term gender all over the world not only in so far as it applies to political movements but also in respect of its presence in public policies and on political agendas.

Conclusions

In the course of this article, following a historiographical strategy adopting the idea of a threefold co-production, our aim has been to show the complexities of the emergence historically of sex as an object of scientific study, which it was to become as the result of debates over the years between different disciplines on the classification, genesis and therapeutics of sex and sexual behaviors.

In this historical account our commitment has been to a constructivism of sex that allows us to see its historicity and the narratives of the body, and at the same time see the social implications of this historicity and these narratives. This transition from one model of the body to others shows us that, as explained by Guerrero-McManus and Muñoz (2018), there is a historical ontology of the sexed body that defines itself through controversies, and constantly changes.

Our objective has been to show that the story of sex told to us by Laqueur is really more complicated and that there are not two models of the body but three, with each model redefining the body not just to take into account scientific evidence but also to uphold a social order that it is intended to legitimize.

Furthermore, these re-conceptualizations of sex will bring in their wake different ways for subjects to become subjects and be intervened in, which means the historicity of sex is linked to the historicity of subjectivities. In this way, the historical ontology of sex

shows us the historicity of the different forms of understanding the body, of living it and transforming it, and how the political history of the subjects whom it is hoped to explain is involved in each conception.

Finally, to conclude this article, it is relevant to note that the feminist philosopher Alison Stone (2007) has developed an approach to sex on the basis of GHP (groups of homeostatic properties), that shares the same characteristics of thinking of the sexed body in terms of degrees, paying attention to its various layers, and thinking of an ontology of biological causes that would explain the body as soma.

In Stone's proposal, developed on the basis of studies of the philosophy of biology, belonging to the male or the female group is decided by having a large enough set of the relevant characteristics of either group. Here sex is also thought of in terms of degrees (not proportions of hormones but considering the layers that emerge from the ontogeny of the sexed body) on a continuum, as it is not necessary to have all the relevant properties to belong to a particular sex but a large enough set of them, so the sex they are given is not the same for all individuals in a group as they have it in different degrees. This then highlights, as the third model proposed in this article showed, that sex can no longer be thought of as the consequence of an absolute property, but as a relative attribute particular to each individual, who is the result of an arrangement of a multiplicity of different properties.

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[2] The term cisheterosexuality is composed of the prefix *cis-* and the word heterosexuality. The *cis-* (as opposed to *trans-*) comes from cisgender, a term coined by Trans Studies to designate the condition of an individual who identifies with the gender that matches the sex he or she was given at birth. Cisheterosexuality does not simply refer to a specific sexuality, that of the heterosexual, but rather to a particular condition of gender identity.

[3] Oudshoorn (2000) points out that the discovery made by endocrinology that sexual hormones were chemical agents of sexual development, began to build explicative bridges between different disciplines of biology dedicated to the study of sex that were previously thought to be in opposition, such as the genetics of sex and the physiology of sex, and now there began to be a conceptualization of sex as a complex feedback system. Some years later Money would present a stratified model of sex, crystallizing research into the biology of sexual development up until the nineteen fifties.